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# Ferns and lycophytes from Lagoa do Peri Municipal Park, Santa Catarina, Brazil

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## Abstract

A checklist of ferns and lycophytes from the Lagoa do Peri Municipal Park (LPMP), an Atlantic Forest remnant in Florianópolis, Santa Catarina, southern Brazil, is presented. Collections were made from October 2015 to April 2016. Herbarium specimens were also analyzed. A total of 81 species of ferns and one lycophyte were found, belonging to 14 families and 42 genera. The most representative families were Polypodiaceae (21 spp.) and Pteridaceae (12 spp.). Among the species, 44% were terrestrial, 31% epiphytes, 29% rupicolous, and 2% hemi-epiphytes. *Macrothelypteris torresiana* (Gaudich.) Ching, an exotic invasive species, was recorded. The number of species found here is lower than reported for similar areas, likely due to anthropogenic activities around and within the park. The constant urbanization occurring around the LPMP emphasizes the importance of the park for conservation of the Atlantic Forest and for maintaining the diversity of ferns and lycophytes.

## Keywords

Atlantic Forest, checklist, conservation, flora, pteridophytes, restinga.

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## Introduction

Ferns and lycophytes are important components of the understory of tropical forests (Smith 1972), representing up to 10% of the total vascular plant flora of continental areas (Grayum and Churchill 1987; Foster and Hubbell 1990; Hammell 1990). In Brazil, there are 1,407 species of ferns and lycophytes (Flora do Brasil 2020). The Atlantic Forest is the richest phytogeographic domain in the country, comprising about 880 species, ca 40% of which are endemic (Prado et al. 2015). Considered a major center of diversity and endemism for Neotropical ferns (Tryon 1972), the Brazilian Atlantic Forest has often been recognized as one of the main biodiversity hotspots of the planet (Mittermeier et al. 1998, 2004; Myers et al. 2000).

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The state of Santa Catarina, in southern Brazil, was almost entirely covered by the Atlantic Forest prior to European settlers. Today, however, only scattered remnants of natural vegetation are found (Vibrans et al. 2013; SOS Mata Atlântica 2019), generally in steep and inaccessible regions, or inside protected areas (Bisheimer et al. 2013). In turn, these protected areas play a central role in preserving natural fragments that are constantly under threat (Schenini et al. 2004).

Several studies on ferns and lycophytes have been carried out in Brazil, including many floristic surveys in the southern region of the country (Dittrich et al. 2005, 2017, 2018; Athayde-Filho and Windisch 2006; Schwartsburd and Labiak 2007; Steffens and Windisch 2007; Paciencia 2008; Santos and Windisch 2008; Lehn et al. 2009; Blume et al. 2010; Gonzatti et al. 2014; Lautert et al. 2015; Mallmann et al. 2018; Michelon et al. 2018; Pereira and Labiak 2018; Matos et al. 2020). More specifically, the flora of ferns and lycophytes in the state of Santa Catarina has been vastly documented through the works of Sehnem for the *Flora Ilustrada Catarinense* (Sehnem 1967, 1968a, 1968b, 1970, 1971, 1972, 1978, 1979a, 1979b), and later of Labiak and Prado (1998), Gasper and Sevegnani (2010), Gasper et al. (2012), and Gasper and Salino (2015). Additionally, Della and Falkenberg (2019) recently reviewed and indicated some "pteridophyte" species as potential indicators of successional stages of vegetation for some formations occurring in the state (*restinga*, dense ombrophilous forest, mixed ombrophilous forest, deciduous forest, and high-altitude grasslands).

In the municipality of Florianópolis, the Lagoa do Peri Municipal Park (LPMP) is one of the largest and most important protected areas of Atlantic Forest (FLORAM 2019). Nevertheless, there are just scarce and fragmented data about the species of ferns and lycophytes that occur inside the LPMP (e.g., Sehnem 1968a, 1970, 1971, 1972, 1978, 1979b; Vibrans et al. 2013). As a first step, floristic lists are quite essential as a basis for more specific studies (Vibrans et al. 2012) and to help in the development of conservation models (Chaves et al. 2013), which are highly needed for threatened environments such as the Atlantic Forest. In this context, we present here a list of species of ferns and lycophytes occurring in the LPMP, along with information on habitat, habit, and geographic distribution of each species, as a contribution to the knowledge of the Atlantic Forest flora in southern Brazil.

## Methods

**Study area.** The LPMP (between the coordinates 27° 42′41″S, 048°30′06″W and 27°46′29″S, 048°33′34″W) is located in the municipality of Florianópolis, state of Santa Catarina, southern Brazil (Fig. 1). Elevations range from 0 to 540 m above sea level, and the park comprises an area of about 2,000 ha, 1,430 of which are occupied by remnants of native vegetation (Soriano-Sierra 1999). The LPMP is the largest protected area in Florianópolis and harbors the Lagoa do Peri watershed (FLORAM 2019). The climate is subtropical, wet and warm (Cfa, according to Köeppen's classification), with an average annual temperature of 20.3 °C (Braga et al. 1986) and average annual precipitation of 1,730 mm (Pandolfo et al. 2002).

The LPMP is located within the Atlantic Forest domain and can be divided in two phytophysiognomies, following IBGE (2012): dense ombrophilous forest (DOF; including lowland, submontane, and montane forests) and *restingas* (quaternary sandy coastal environments). The DOF represents the largest area in the park, while *restingas* are restricted to smaller portions

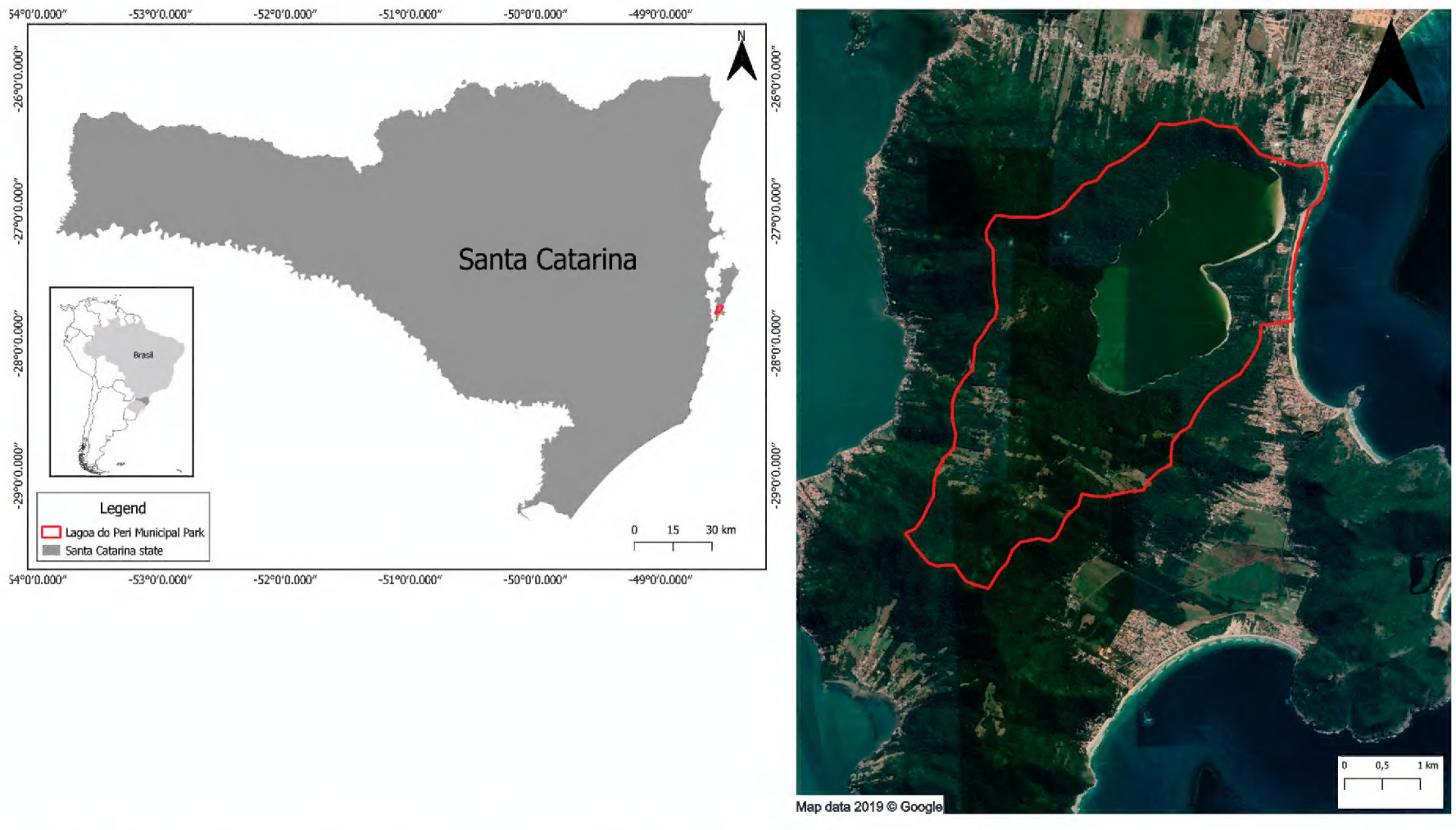


**Figure 1.** Location of the Lagoa do Peri Municipal Park, Santa Catarina, Brazil.

(Falkenberg 1999; Soriano-Sierra 1999). The plant composition of *restingas* varies from herbs growing mainly in dunes to trees such as *Guapira opposita* (Vell.) Reitz and *Eugenia catharinae* O. Berg (Caruso 1990; Cabral 1999). Secondary forests of late successional stage are the most common vegetation within the park, mainly along the slopes. Isolated individuals of the exotic genera *Pinus* L. and *Eucalyptus* L'Hér., both used for reforestation in the 1980's, can also be found in the region (Cabral 1999).

**Sampling and identification.** Twenty-eight field trips were carried out once a week, between October 2015 and April 2016. The specimens were deposited at Herbarium of the Federal University of Santa Catarina (FLOR; acronym following Thiers 2020). Additional collections made by other botanists in the area were found at Herbarium of the Federal University of Santa Catarina, Santa Catarina (FLOR), Herbarium of the State University of Londrina, Paraná (FUEL), Herbarium Dr. Roberto Miguel Klein, Regional University of Blumenau, Santa Catarina (FURB), Herbarium of the University of Caxias do Sul, Rio Grande do Sul (HUCS), William and Lynda Steere Herbarium of The New York Botanical Garden (NY), Herbarium Anchieta, Anchietano Research Institute/ Vale do Rio dos Sinos University, Rio Grande do Sul (PACA), and the United States National Herbarium, Smithsonian Institution, Washington (US). Specimens from FUEL, HUCS, NY, and US were analyzed through online photographs (INCT 2020; Reflora 2020). The specimens from PACA, which were found via speciesLink (2020), could not be examined and are here listed under "unconfirmed species". All of these unconfirmed species were collected by Aloysio Sehnem in the 1960's.

The plants were identified using literature and by comparison to specimens deposited in herbaria. When necessary, specialists were consulted in order to confirm the identifications (see acknowledgements). Family classification follows PPG I (2016) and species authors' names follow IPNI (2020). Habit was characterized according to Lellinger (2002) with minor modifications: epiphytes are plants exclusively growing on another plant; hemi-epiphytes are plants that climb on tree trunks while still rooted to the ground; rupicolous are plants growing on rocks; and terrestrial are plants growing on soil. The distribution patterns of each species follow the classification of Labiak and Prado (1998): (1) pantropical - species that are widespread throughout the tropical regions of the world; (2) neotropical - species that are restricted to tropical and/or subtropical regions of America, including southern U.S.A.; (3) species endemic to South America; (4) species endemic to Brazil; and (5) species endemic to southeastern and/or southern Brazil. Distribution, habitat, and habit data of Brazilian species were taken from Flora do Brasil (2020). For the pantropical species, these data are from GBIF (https://www.gbif.org/).

We provide brief morphological descriptions and comments of two species for each of the most diverse families (Aspleniaceae, Blechnaceae, Dryopteridaceae, Hymenoplhyllaceae, Pteridaceae and Polypodiaceae), and one species for each of the remaining families.

## Results

A total of 81 species of ferns and one lycophyte were confirmed to occur in the LPMP, belonging to 14 families and 42 genera (Figs 2, 3). Five additional species found at PACA could not be examined and are listed below as "unconfirmed species".

Among the confirmed taxa, the richest families in number of species were Polypodiaceae (21 spp.), Pteridaceae (12 spp.), and Aspleniaceae (12 spp.). The most representative genus in number of species was *Asplenium* L. (Aspleniaceae; 12 spp.), followed by *Campyloneurum* C. Presl, *Microgramma* C. Presl, *Pecluma* M.G. Price, *Pleopeltis* Humb. & Bonpl. ex Willd., and *Serpocaulon* A.R. Sm. (all Polypodiaceae; 4 spp. each). Four families and 24 genera were represented by only one species. *Phlegmariurus flexibilis* (Fée) B.Øllg. is the only confirmed species of lycophyte. An exotic invasive species was recorded (*Macrothelypteris torresiana* (Gaudich.) Ching). *Asplenium bradei* Rosenst. is here recorded for the first time in the state of Santa Catarina.

As for the phytophysiognomies inside the LPMP, 75 species (91%) occur exclusively in DOF, two species (*Telmatoblechnum serrulatum* (Rich.) Perrie, D.J. Ohlsen & Brownsey and *Serpocaulon vacillans* (Link) A.R.Sm.) are exclusive to the *restinga*, and four species (*Asplenium serra* Langsd. & Fisch., *Microgramma vacciniifolia* (Langsd. & Fisch.) Copel., *Pleopeltis lepidopteris* (Langsd. & Fisch.) de la Sota, and *Rumohra adiantiformis* (G.Forst.) Ching) occur in both DOF and *restinga*.

Concerning the habit, most species in the LPMP are terrestrial (36 spp.; 44%), followed by epiphyte (26 spp.; 31%), rupicolous (24 spp.; 29%) and hemi-epiphyte (2 spp.; 2%). Eight species have more than one habit. Regarding the global distribution patterns, most species are neotropical (31 spp.; 37%) or restricted to South America (25 spp.; 30%). Among the Brazilian endemic species, 3 spp. (3%) are also endemic to southeastern and/or southern Brazil, while 16 spp. (19%) occupy other regions in the country. Furthermore, 7 spp. (8%) are pantropical.

The list of all taxa found in the park, along with their respective habitat, habit, distribution pattern, and specimen vouchers is presented below.

Anemiaceae Link

***Anemia phyllitidis* (L.) Sw.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP, alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1944 col.; FURB 05160. • ibid, trilha do

Saquinho; alt. 15 m; 1 Apr. 2016; A.A. Carmes et al. 40 col.; FLOR 0062859.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial, rupicolous.

**Distribution pattern.** Neotropical.

*Anemia raddiana* **Link**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP, trilha da Gurita; alt. 50 m; 11 Mar. 2016; A.A. Carmes et al. 49 col.; FLOR 0062847.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

**Identification.** Rhizomes short-creeping, densely covered with light-brown hairs 5–7 mm long; leaves hemidimorphic; petioles stramineous, usually darker at the base, densely covered with hairs; blades 2-pinnate pinnatifid to 2-pinnate, deltate; basal sterile pinnae asymmetric, the basicopic pinnules oblong to lanceolate and pinnatifid, the acroscopic ones ovate, and pinnatifid to almost crenate. The only other species of the genus in the area, *Anemia phyllitidis*, differs by erect rhizomes (vs short-creeping), 1-pinnate blades (vs 2-pinnate-pinnatifid to 2-pinnate), and areolate veins (vs free).

Aspleniaceae Newman

*Asplenium bradei* **Rosenst.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri; alt. 25 m; 08 Nov. 2019; N.P. Smith et al. 702 col.; FLOR 0068069.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to southeastern and southern Brazil.

**Identification.** Rhizomes erect, covered with lanceolate, clathrate scales; leaves monomorphic; petioles light-brown, ¼–½ of the sterile leaf length, with sparse, linear, dark-brown scales; rachises alate; blades 1-pinnate, deltoid-lanceolate to lanceolate; pinnae glabrous, asymmetric, the proximal ones more developed acroscopically, the distal ones dimidiate, with rounded apices and serrate margins; veins free; sori linear; and indusia with entire margins. It is similar to *Asplenium inaequilaterale* Willd., which differs by shorter petioles (less than ¼ vs ¼–½ of the sterile leaf length) and acute pinna apices (vs rounded).

*Asplenium brasiliense* **Sw.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1462 col.; CRI 9939, FURB 05335.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to South America.

*Asplenium claussenii* **Hieron.**

Figure 2C, D

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 150 m; 17 Apr. 1980; A. Bresolin and M.L. Souza 1417 col.; FLOR 0021525, FURB05412. • ibid, PMLP; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2850 col.; FURB 05425. • ibid; alt. 45 m; 4 Oct. 2016; A.A. Carmes et al. 54 col.; FLOR 0062836.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial, rupicolous.

**Distribution pattern.** Neotropical.

*Asplenium feei* **Kunze ex Fée**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 300 m; 14 Apr. 1980; A. Bresolin and M.L. Souza 1424 col.; FLOR 0021529, FURB 05431.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Neotropical.

*Asplenium inaequilaterale* **Willd.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; Stival-Santos et al. 1969 col.; FURB 05613. • ibid; alt. 50 m; 1 Apr. 2016; A.A. Carmes 65 col.; FLOR 0062849.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Pantropical.

*Asplenium kunzeanum* **Klotzsch ex Rosenst.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Parque Municipal da Lagoa do Peri; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1476 col.; FLOR 0042495, FURB 05682. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2837 col.; CRI 9889, FURB 05666.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to Brazil.

*Asplenium mucronatum* **C.Presl**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 300 m; 17 Apr. 1980; A. Bresolin and M.L. Souza 1423 col.; FLOR 0021528, FURB 05763. • ibid, LPMP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1468 col.; FURB 05795. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2819 col.; FURB 05776.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

**Identification.** Rhizomes erect, covered with lanceolate, clathrate scales; leaves monomorphic; petioles green to brown, ca ⅙ of the sterile leaf length, glabrous;

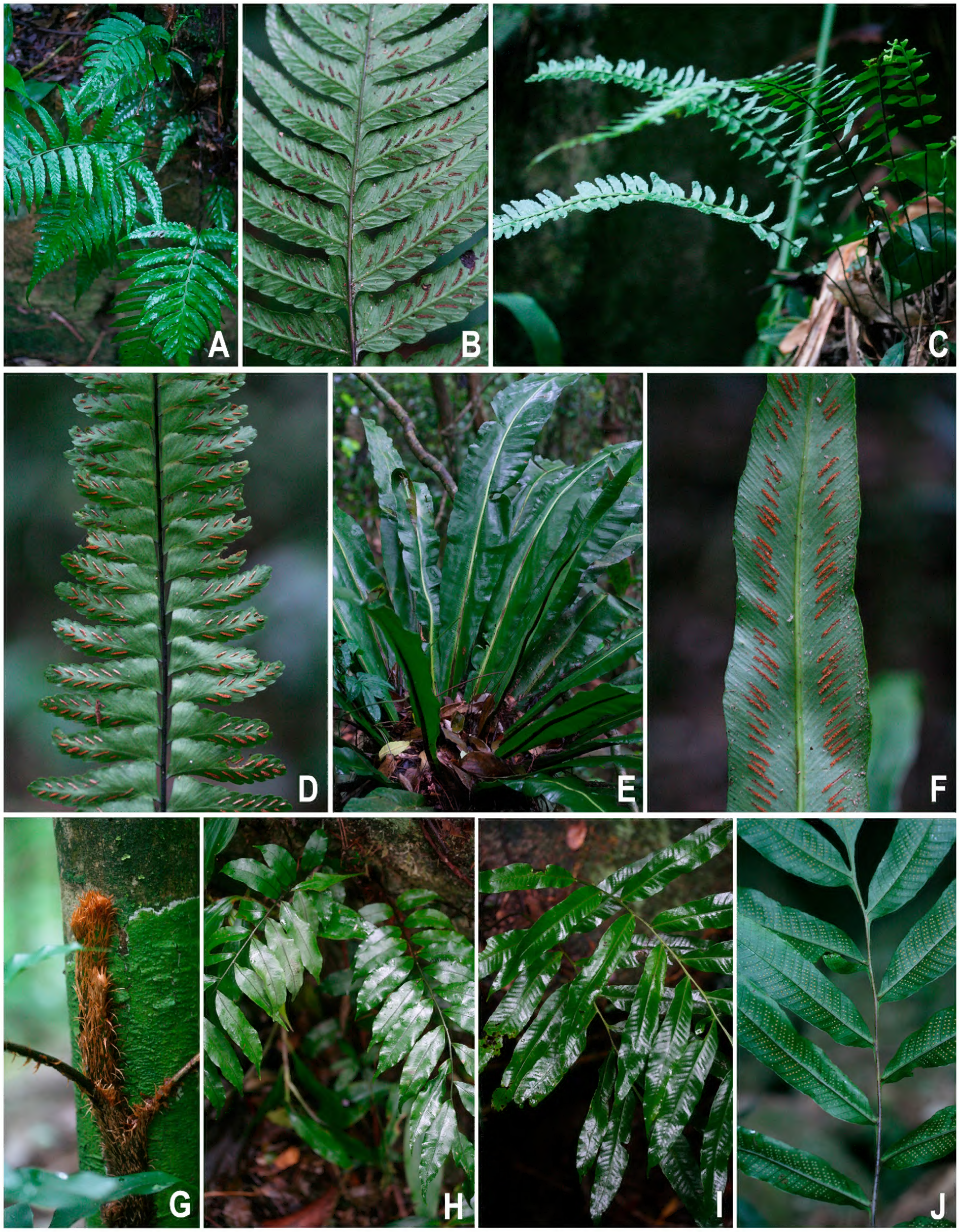


**Figure 2.** Ferns recorded in the Lagoa do Peri Municipal Park. **A–B.** *Diplazium cristatum*. **A.** Habit. **B.** Fertile frond, abaxial view. **C–D.** *Asplenium claussenii*. **C.** Habit. **D.** Fertile frond, abaxial view. **E–F.** *Asplenium serratum*. **E.** Habit. **F.** Fertile frond, abaxial view. **G–H.** *Lomariopsis marginata*. **G.** Creeping rhizome covered with scales. **H.** Habit. **I–J.** *Campyloneurum decurrens*. **I.** Habit. **J.** Fertile frond, abaxial view.

rachises alate; blades 1 pinnate-pinnatifid, linear-lanceolate; pinnae glabrous, nearly symmetric, gradually reduced towards the base of the blade, with mucronate apices and margins; veins free; sori linear; and indusia with undulate margins. It is similar to *Asplenium pteropus* Kaulf., which differs by lanceolate blades (vs linear-lanceolate), alae interrupted at junctions of rachises and pinnae (vs alae continuous), and pinnae entire with serrate margins (vs pinnatifid, the segments with mucronate apices).

*Asplenium oligophyllum* **Kaulf.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 300 m; 21 Feb. 1980; A. Bresolin 1401 col.; FLOR 0021533. • ibid, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1529 col.; FUEL 003119, FURB 05818. • ibid; alt. 317; 24 Jun. 2010; T.J. Cadorin et al. 2840 col.; FUEL 003129, FURB 27846.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to South America.

*Asplenium pteropus* **Kaulf.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2848 col.; FURB 05853.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Neotropical.

*Asplenium scandicinum* **Kaulf.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1470 col.; FUEL 003096, FURB 05902. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin 2812 col.; CRI 9892, FURB 06026.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

*Asplenium serra* **Langsd. & Fisch.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 9 m; 10 Mar. 2010; A. Stival-Santos et al. 1917 col.; CRI 9861, FURB 06060. • ibid; alt. 13 m; 9 Mar. 2010; T. J. Cadorin et al. 1463 col.; FURB 00035.

**Habitat.** Dense Ombrophilous Forest, restinga.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

*Asplenium serratum* **L.**

Figure 2 E, F

**Material examined.** BRAZIL • Santa Catarina, Ilha Sta. Catarina, Lagoa Peri; alt. 10 m; 4 Jan. 1960; A. Sehnem 7605 col.; US 01513121. • ibid, Florianópolis, PMLP; alt. 30 m; 4 Oct. 2016; A.A. Carmes et al. 51 col.; FLOR 00628610.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Neotropical.

Athyriaceae Alston

*Diplazium cristatum* **(Desr.) Alston**

Figure 2A, B

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1999 col.; FURB 062069. • ibid; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1459 col.; FURB 06208. • ibid; alt. 30 m; 4 Oct. 2016; A.A. Carmes et al. 63 col.; FLOR 0062852.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

**Identification**. Rhizomes erect or decumbent, covered with lanceolate, non-clathrate scales; petioles mostly light-brown, usually darker proximally, with sparse, lanceolate, dark-brown scales; blades 1-pinnate, lanceolate, proximally pinnatifid and distally pinnatisect; basal pinnae more developed acroscopically; veins free, simple to 1–3 forked; sori linear; and indusia with entire margins. Not easily confused with any other species from the area.

Blechnaceae Newman

*Blechnum occidentale* **L.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 21 m; 11 Mar. 2016. A.A. Carmes et al. 28 col.; FLOR 0062863.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

*Blechnum polypodioides* **Raddi**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos 1933 col.; FURB00051, HUCS000620. • idib, trilha da Gurita; alt. 21 m; 1 Aug. 2016; A.A. Carmes et al. 45 col.; FLOR 0062857.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

**Identification.** Rhizomes erect, covered with lanceolate, dark brown scales; leaves monomorphic; petioles stramineous, glabrous, except at the base; rachises covered with light brown to orange hairs; blades pinnatisect, lanceolate; pinnae adnate, gradually reduced to auricles towards the base of the blade; veins free, simple or forked, distally thickened; sori linear; and indusia entire to erose. The most similar species in the park is *Blechnum occidentale*, which differs by ovate blades (vs lanceolate), the first pair of pinnae lanceolate (vs triangular) and slightly smaller or of the same size as the above pinnae (vs reduced to auricles), and the first two pairs of pinnae totally free (vs adnate to the rachis).

*Lomaridium plumieri* **(Desv.) C.Presl**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1590 col.; FURB 06358. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2832 col.; CRI 9892; FURB 06450.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial, hemiepiphyte.

**Distribution pattern.** Neotropical.

**Identification.** Rhizomes long-creeping, densely covered with linear to linear-lanceolate, usually bicolorous (tan with a dark central stripe) scales; leaves holodimorphic; petioles stramineous to atropurpureus, with scales similar to those of the rhizomes; sterile blades pinnatisect to pinnate, lanceolate; sterile pinnae linear-lanceolate with acuminate apices, abruptly reduced towards the base of the blade; fertile blades pinnatisect, linear-lanceolate; fertile pinnae linear with acute apices, gradually reduced towards the base of the blade; sori acrostichoid; indusia absent. It differs from all other species of Blechnaceae that occur in the area by the hemiepiphytic habit, long-creeping rhizomes, and holodimorphic leaves.

***Neoblechnum brasiliense* (Desv.) Gasper & V.A.O. Dittrich.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Parque Municipal Lagoa do Peri, trilha do Saquinho; alt. 44 m; 18 Mar. 2016; A.A. Carmes et al. 32 col.; FLOR 0062831.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

***Telmatoblechnum serrulatum* (Rich.) Perrie, D.J. Ohlsen & Brownsey**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 9 m; 10 Mar. 2010; A. Stival-Santos et al. 1928 col.; FURB 06828. • ibid, trilha da restinga; alt. 12 m; 17 Sep. 2015; A.A. Carmes & P. Fiaschi 21 col.; FLOR 0062864.

**Habitat.** Restinga.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

Cyatheaceae Kaulf.

***Alsophila setosa* Kaulf.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 35 m; 4 Oct. 2016; A.A. Carmes et al. 55 col.; FLOR 0062848.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial, arborescent.

**Distribution pattern.** Endemic to South America.

**Identification.** Rhizomes erect, arborescent, with persistent leaf bases; leaves monomorphic; petioles scaly and spiny at the base, with dark brown to black spines and scales with a dark apical seta; blades 2-pinnate-pinnatifid; adventitious pinnae or aphlebiae present at the base of the petioles; sori round; indusia hemitelioid. The other species of Cyatheaceae that occur in the area differ by petiole scales without a dark apical seta (vs dark apical seta present), absence of aphlebiae (vs aphlebiae present at the base of petioles), and absence of indusia (vs indusia present).

***Cyathea atrovirens* (Langsd. & Fisch.) Domin**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri; alt. 2 m; 4 Jan. 1960; A. Sehnem 7613 col.; HUCS 000853.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial, arborescent.

**Distribution pattern**. Endemic to South America.

***Cyathea corcovadensis* (Raddi) Domin**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 3 Mar. 2010; J.L. Schmitt 1591 col.; FURB 07033. • ibid; alt. 45 m; 4 Oct. 2016; A.A. Carmes et al. 57 col.; FLOR 0062834.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial, arborescent.

**Distribution pattern.** Endemic to Brazil.

Didymochlaenaceae Ching ex Li-Bing Zhang & Liang Zhang

***Didymochlaena truncatula* (Sw.) J.Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1961 col.; FURB 07706. • ibid; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1589 col.; FURB 07705.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Pantropical.

**Identification.** Rhizomes erect; leaves monomorphic; petioles stramineous, thick (ca 1.5 cm diameter), long (ca ⅓ the frond length), densely covered with brownish scales; rachises similar to petioles; blades 2-pinnate; pinnules subdimidiate, sessile; sori and indusia elliptic-oblong. Not easily confused with any other species from the area.

Dryopteridaceae Herter

***Ctenitis paranaensis* (C.Chr.) Lellinger**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri; alt. 25 m; 11 Fev. 2015; N.P. Smith and P. Fiaschi 511 col.; FLOR 068070.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

***Ctenitis submarginalis* (Langsd. & Fisch.) Ching**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1966 col.; BHCB 160710, FURB 25174.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

*Elaphoglossum glaziovii* **(Fée) Brade**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 12 Mar. 2010; T.J. Cadorin et al. 1638 col.; FURB 07766.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to Brazil.

**Identification.** Rhizomes short-creeping, covered with light-brown scales; leaves holodimorphic; petioles stramineous, ca ⅓–½ of the sterile leaf length, densely covered with patent, subulate scales; sterile blades entire, narrowly elliptic, apices acuminate; blade scales largely limited to costae and margins, the costal ones subulate and patent, the marginal ones cordate and appressed; fertile blades entire, elliptic, ca ⅓ smaller than the sterile blades, with petioles longer than those of sterile blades; sori acrostichoid; and indusia absent. The most similar species in the park is *Elaphoglossum luridum* (Fée) Christ, which differs by shorter petioles (⅒ vs ⅓–½ of the sterile leaf length), oblanceolate to broadly elliptic blades (vs narrowly elliptic), and absence of scales along the margins of sterile blades (vs marginal scales present).

*Elaphoglossum luridum* **(Fée) Christ**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1531 col.; FURB 07867.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

*Megalastrum connexum* **(Kaulf.) A.R.Sm. & R.C.Moran**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos 1971 col.; BHCB 160721, FURB 08043. • ibid; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 2013 col.; FURB 08049.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to South America.

*Mickelia scandens* **(Raddi) R.C. Moran, Labiak & Sundue**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1485 col.; FURB 08107.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Hemi-epiphyte.

**Distribution pattern.** Endemic to Brazil.

*Olfersia cervina* **(L.) Kunze**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1628 col.; FURB 08135.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Neotropical.

*Parapolystichum effusum* **(Sw.) Ching**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos 1967 col.; BHCB 171039, FLOR 0059425, FURB 08022; HUCS 001340. • ibid, trilha do Saquinho; alt. 12 m; 4 Mar. 2016; A.A. Carmes et al. 50 col.; FLOR 0062846.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

**Identification.** Rhizomes short-creeping, covered with lanceolate, brown scales; leaves monomorphic; petioles stramineous to brown, densely covered with brown scales at the base; rachises adaxially covered with short, reddish hairs; blades up to 3-pinnate-pinnatifid, usually with a scaly proliferous bud in the axil of a distal pinna; pinnules adnate; sori round; and indusia absent. Not easily confused with any other species from the area.

*Rumohra adiantiformis* **(G.Forst.) Ching**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 9 m; 10 Mar. 2010; A. Stival-Santos et al. 1916 col.; FURB 08300. • ibid; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1507 col.; FURB 08298. • ibid, trilha da restinga; alt. 11 m; 1 Oct. 2015; A.A. Carmes 24 col.; FLOR 0062843.

**Habitat.** Dense Ombrophilous Forest, restinga.

**Habit.** Terrestrial, epiphyte.

**Distribution pattern.** Pantropical.

*Stigmatopteris heterocarpa* **(Fée) Rosenst.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1588 col.; FURB 08386.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

Hymenophyllaceae Gaudich.

*Didymoglossum krausii* **(Hook. & Grev.) C.Presl**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2854 col.; FURB 09539.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Neotropical.

**Identification.** Rhizomes long-creeping, filiform, densely covered with dark brown hairs of 0.5 mm long; leaves monomorphic, less than 5 cm long; petioles nearly absent, 1–2 mm long; blades 1-pinnatifid with lobed margins, oblong-lanceolate, membranaceous; sori marginal

on the distal part of the blades, 2–7 per leaf; and indusia tubular, immersed in the laminar tissue, bilabiate, dark-margined. The most similar species in the park is *Trichomanes polypodioides* L., which differs by the presence of roots (vs roots lacking), and leaves longer than 5 cm, reaching up to 7 cm long.

***Hymenophyllum asplenioides* (Sw.) Sw.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1625 col.; FURB 08581.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Neotropical.

**Identification.** Rhizomes long-creeping, filiform, covered with small hairs; leaves monomorphic, 4.3–6 cm long; petioles not winged; blades 1-pinnatifid with lobed margins, linear-lanceolate, membranaceous; sori marginal along the lobes or restricted to the apices of blades, 12–28 per leaf; indusia nearly round, bivalved. The most similar species in the park is *Hymenophyllum caudiculatum* Mart., which differs by longer blades (longer than 6 cm vs 4.3–6), more divided leaves (2-pinnatifid vs 1-pinnatifid), and winged petioles (vs petioles non-winged).

***Hymenophyllum caudiculatum* Mart.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1624 col.; FURB 08612, LUSC 7629.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to South America.

***Polyphlebium angustatum* (Carmich.) Ebihara & Dubuisson**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1503 col.; FURB 09309. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2826 col.; FURB 09354.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Neotropical.

***Trichomanes polypodioides* L.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1504 col.; FURB 09456. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2821 col.; FURB 09445.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern**. Endemic to South America.

***Vandenboschia radicans* (Sw.) Copel.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 350 m; 21 Feb. 1980; A. Bresolin 1402 col.; FLOR 0021532, FURB 09497. • ibid; alt. 350 m; 21 Feb. 1980; A. Bresolin 1404 col.; FLOR 0021531, FURB 09494. • ibid, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1472 col.; CRI 12242, FURB 09613. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2815 col.; FURB 09583.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Pantropical.

***Vandenboschia rupestris* (Raddi) Ebihara & K.Iwats.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Ilha de Santa Catarina, prope Lagoa do Peri; alt. 200 m; 02 Jan. 1960; A. Sehnem 7610 col.; HUCS 001756.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Neotropical.

Lomariopsidaceae Alston

***Lomariopsis marginata* (Schrad.) Kuhn**

Figure 2G, H

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Parque da Lagoa do Peri, Cachoeira Pequena; alt. 250 m; 22 Jan. 1980; A. Bresolin 1384 col.; FLOR 0021530, FURB 08961.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Hemi-epiphyte.

**Distribution pattern.** Endemic to Brazil.

**Identification.** Rhizomes long-creeping, covered with narrowly lanceolate, reddish brown scales; leaves holodimorphic; petioles stramineous to brown, 10–30 cm long, with scales similar to those of the rhizomes; sterile blades 1-pinnate, ovate; sterile pinnae lanceolate, apices acuminate; fertile blades 1-pinnate; fertile pinnae narrower than the sterile ones, linear-lanceolate, apices acuminate; sori acrostichoid; and indusia absent. Not easily confused with any other species from the area.

Lycopodiaceae Mirb.

***Phlegmariurus flexibilis* (Fée) B.Øllg.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, LPML; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1630 col.; FURB 09164.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to Brazil.

**Identification.** Stems pendulous, isotomously branched throughout, slightly to strongly flexuous, making a sharp bend at each leaf attachment; leaves linear-lanceolate to lanceolate, spreading to ascending, spirally arranged; and sporangia axillary, reniform, isovalvate, with a short slender stalk. Not easily confused with any other species from the area.

Polypodiaceae J. Presl.

*Campyloneurum atlanticum* **R.C. Moran & Labiak**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1970 col.; FURB 12626. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin 2828 col.; FUEL 002486, FURB 12708.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to southeastern and southern Brazil.

*Campyloneurum decurrens* **(Raddi) C. Presl**

Figure 2I, J

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 45 m; 4 Oct. 2016; A.A. Carmes et al. 64 col.; FLOR 006287.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to Brazil.

**Identification.** Rhizomes short-creeping, covered with ovate-lanceolate, clathrate, dark brown scales; leaves monomorphic; petioles glabrous, except at the base, which has light to dark brown scales; blades 1-pinnate, ovate, glabrous; pinnae lanceolate, apices caudate, distal pinnae and terminal segment strongly decurrent; veins regularly areolate, with 6–8 areoles between the costa and margin, 2 or 3 included veinlets per areole; sori round; and indusia absent. This is the only species of *Campyloneurum* with 1-pinnate blades in Brazil. Not easily confused with any other species in the area.

*Campyloneurum nitidum* **(Kaulf.) C.Presl**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2838 col.; FLOR 0042376, FURB 12914. • ibid; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1482 col.; FURB 12824. • ibid; alt. 30 m; 4 Oct. 2016; A.A. Carmes et al. 53 col.; FLOR 0062862.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

*Campyloneurum rigidum* **Sm.**

Figure 3A, B

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1515 col.; FURB 13000. • ibid; alt. 45 m; 4 Oct. 2016; A.A. Carmes et al. 56 col.; FLOR.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous, epiphyte.

**Distribution pattern.** Endemic to South America.

*Microgramma percussa* **(Cav.) de la Sota**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri; 1 Nov. 1950; J.A. Rohr 1096 col.; FLOR 0005761, NY 671865, US 2350633.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous, epiphyte.

**Distribution pattern.** Neotropical.

*Microgramma squamulosa* **(Kaulf.) de la Sota**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1475 col.; BHCB 142976, FURB 13193. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2813 col.; FURB 13170. • ibid; alt. 46 m; 8 Apr. 2016; A.A. Carmes et al. 33 col.; FLOR 0062866.

**Habitat.** Dense Ombrophilous Forest, restinga.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

*Microgramma tecta* **(Kaulf.) Alston**

Figure 3C

**Material examined.** BRAZIL • Santa Catarina, Ilha de Sta. Catarina, Lagoa do Peri; alt. 100 m; 4 Jan. 1960; A. Sehnem 7604 col.; US 254917. • ibid, Florianópolis, PMLP; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2829 col.; FURB 13306. • ibid, Florianópolis, PMLP; 4 Oct. 2016; A.A. Carmes et al. 52 col.; FLOR 0062855.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte, rupicolous.

**Distribution pattern.** Neotropical.

*Microgramma vacciniifolia* **(Langsd. & Fisch.) Copel.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 9 m; 10 Mar. 2010; A. Stival-Santos et al. 1931 col.; BHCB 143000, FURB 13360. • ibid; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1471 col.; FURB 13359. • ibid, trilha da restinga; alt. 11 m; 21 Sep. 2015; A.A. Carmes et al. 34 col.; FLOR 0062850.

**Habitat.** Dense Ombrophilous Forest, restinga.

**Habit.** Epiphyte.

**Distribution pattern.** Neotropical.

*Niphidium crassifolium* **(L.) Lellinger**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1544 col.; FURB 13136.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Neotropical.

*Pecluma chnoophora* **(Kunze) Salino & Costa Assis**

Figure 3D

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 200 m; 17 Apr. 1980; A. Bresolin and M.L. Souza 1418; BHCB 161109, FLOR 0021524, FURB 13481. • ibid, PMLP; alt. 31 m; 4 Oct. 2016; A.A. Carmes et al. 60 col.; FLOR 0062854.

**Figure 3.** Ferns recorded in the Lagoa do Peri Municipal Park. **A–B.** *Campyloneurum rigidum*. **A.** Habit. **B.** Fertile frond, abaxial view. **C.** *Microgramma tecta*, habit. **D.** *Pecluma chnoophora*, fertile frond, abaxial view. **E.** *Adiantum pentadactylon*, fronds, adaxial view. **F–G.** *Polytaenium cajenense*. **F.** Habit. **G.** Fertile frond, abaxial view. **H.** *Pteris denticulata*, fertile frond, abaxial view. **I–J.** *Tectaria incisa*. **I.** Habit. **J.** Fertile frond, abaxial view.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to South America.

***Pecluma recurvata* (Kaulf.) M.G. Price**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos

et al. 1931 col.; FURB 09864. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2845 col.; FURB 09836. • Santa Catarina, Florianópolis, PMLP; alt. 45 m; 4 Oct. 2016; A.A. Carmes et al. 59 col.; FLOR 0062833.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to South America.

***Pecluma robusta* (Fée) M. Kessler & A.R.Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP, trilha do Saquinho; alt. 15 m; 18 Mar. 2016; A.A. Carmes et al. 38 col.; FLOR 0062858.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to South America.

***Pecluma truncorum* (Lindm.) M.G.Price**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1473 col.; FURB 10007. • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2827 col.; CRI 9949, FURB 10170.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

***Pleopeltis astrolepis* (Liebm.) E.Fourn.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1533 col.; FURB 10214.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Neotropical.

***Pleopeltis hirsutissima* (Raddi) de la Sota**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1510 col.; FURB 10381.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

***Pleopeltis lepidopteris* (Langsd. & Fisch.) de la Sota**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 9 m; 10 Mar. 2010; A. Stival-Santos et al. 1918 col.; FURB 10452. • ibid; alt. 13 m; 9 Mar. 2010; J. L. Schmitt 1584 col.; FURB 10453. • Santa Catarina, Florianópolis, PMLP, trilha da restinga; alt. 11 m; 1 Oct. 2015; A.A. Carmes et al. 23 col.; FLOR 0062844.

**Habitat.** Restinga, Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

***Pleopeltis pleopeltifolia* (Raddi) Alston**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2831 col.; FURB 10573.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to Brazil.

***Serpocaulon catharinae* (Langsd. & Fisch.) A.R.Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1492 col.; FUEL 001194, FURB 10783.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to South America.

***Serpocaulon latipes* (Langsd. & Fisch.) A.R.Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 50 m; 1 Apr. 2016; A.A. Carmes et al. 39 col.; FLOR 0062842.

**Habitat.** Dense Ombrophilous Forest, restinga.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

***Serpocaulon menisciifolium* (Langsd. & Fisch.) A.R.Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1541 col.; FLOR 0042464, FURB 10974. • ibid, trilha do Saquinho; alt. 17 m; 18 Mar. 2016; A.A. Carmes et al. 29 col.; FLOR 0062860.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Endemic to Brazil.

**Identification.** Rhizomes short-creeping, covered with ovate to lanceolate, clathrate, brown scales; leaves monomorphic; petioles proximally castaneous, distally green to light brown, ca ⅓ of the leaf length; blades 1-pinnate, ovate-lanceolate to narrowly lanceolate; pinnae adnate with an asymmetric base, basiscopically cuneate, acroscopically excurrent, and covered with short whitish hairs and scattered scales on both surfaces; veins regularly areolate, with 2(–3) areoles between the costa and margin, and a single included veinlet per areole; sori round; and indusia absent. The most similar species in the area is *Serpocaulon vacillans* (Link) A.R.Sm., which differs by pinnatisect blades (vs 1-pinnate).

***Serpocaulon vacillans* (Link) A.R.Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 9 m; 10 Mar. 2010; A. Stival-Santos et al. 1974 col.; CRI 9905, FUEL 001153, FURB 10983.

**Habitat.** Restinga.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

Pteridaceae E.D.M. Kirchn.

***Adiantum pentadactylon* Langsd. & Fisch.**
Figure 3 E

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1461 col.; BHCB 171013, FURB 22471. • ibid; alt. 21 m; 11 Mar. 2016; A.A. Carmes et al. 42 col.; FLOR 0062841.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to southeastern and southern Brazil.

***Adiantum pseudotinctum* Hieron.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1943 col.; FURB 11992.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to South America.

**Identification.** Rhizomes long-creeping, covered with dark-brown scales; leaves monomorphic; petioles dark-brown, ca ⅓–½ of the leaf length; rachises dark brown, shiny, glabrous, sub-dichotomously divided; blades 4-pinnate; pinnules flabellate, margins of the segments crenate to lobate, base obtuse; sori at the margin of the segments, 1–4 per pinnule; and false indusia reniform, formed by the revolute margins of the blades. The most similar species in the park is *Adiantum raddianum* C.Presl, which differs by short-creeping rhizomes (vs long-creeping); 3-pinnate blades (vs 4-pinnate), and pinnules with cuneate bases (vs truncate).

***Adiantum raddianum* C.Presl**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP, trilha do Saquinho; alt. 44 m; 11 Mar. 2016; A.A. Carmes et al. 46 col.; FLOR 0062839.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Neotropical.

***Doryopteris collina* (Raddi) J.Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1457 col.; FURB 11098.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to South America.

***Doryopteris pentagona* Pic. Serm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 50 m; 1 Apr. 2016; A.A. Carmes et al. 41 col.; FLOR 0062856.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial, rupicolous.

**Distribution pattern.** Endemic to South America.

**Identification.** Rhizomes short-creeping to suberect; leaves monomorphic; petioles nigrescent, ¼–⅓ of the leaf length; blades pentalobed, basal segments 2-pinnatifid, with two basicoscopic lobes, other segments 1-pinnatifid, with acute to acuminate apices; veins completely areolate, hydathodes present on the upper margins of sterile blades; sori continuous along the margins; and indusia formed by the recurved leaf margin. The most similar species in the park is *Doryopteris collina*, which differs by petioles terete, subterete or plane adaxially (vs petioles wing-angled adaxially, at least on the distal half or fourth), and the absence of hydathodes (vs hydathodes present).

***Hemionitis tomentosa* (Lam.) Raddi**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 52 m; 18 Mar. 2016; A.A. Carmes et al. 44 col.; FLOR 0062840.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to South America.

***Polytaenium cajenense* (Desv.) Benedict**
Figure 3F, G

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 200 m; 17 Apr. 1980; A. Bresolin and M.L. Souza 1420 col.; FLOR 0021523, FURB 11297. • ibid; PMLP; alt. 30 m; 4 Oct. 2016; A.A. Carmes et al. 58 col.; FLOR 0062851.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte, rupicolous.

**Distribution pattern.** Neotropical.

***Pteris brasiliensis* Raddi**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, próximo da Armação; alt. 5 m; 17 Sep. 1992; D.B. Falkenberg and A. Zanin 5827 col.; FLOR 0022574.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to South America.

***Pteris deflexa* Link**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1962 col.; FURB 00310.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

***Pteris denticulata* Sw.**
Figure 3H

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 26 m; 4 Mar. 2016; A.A. Carmes et al. 27 col.; FLOR 0062832.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

*Vittaria lineata* **(L.) Sm.**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1631 col.; FURB 1129. • ibid; alt. 48 m; 1 Apr. 2016; A.A. Carmes et al. 43 col.; FLOR 0062838.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Epiphyte.

**Distribution pattern.** Neotropical.

*Vittaria scabrida* **Klotzsch**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1527 col.; FURB 11633. • ibid; alt. 317 m; 24 Jun. 2010; T.J. Cadorin et al. 2835 col.; FURB 11629.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Endemic to South America.

Tectariaceae

*Tectaria incisa* **Cav.**

Figure 3I, J

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 30 m; 4 Oct. 2016; A.A. Carmes et al. 61 col.; FLOR 0062853.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Rupicolous.

**Distribution pattern.** Neotropical.

**Identification.** Rhizomes erect to suberect, with lanceolate, brown scales; leaves monomorphic; petioles stramineous to brownish, with scattered hairs 0.1 mm long; rachises glabrous or glabrescent; blades 1-pinnate, oblong to ovate-oblong, with 5–7 pairs of pinnae, apical pinna acuminate, with decurrent base, each basal pinnae with a single, elongate, proximal, basiscopic lobe; veins reticulate, the areoles typically with included veinlets; sori round; and indusia present, reniform. It is similar to *Tectaria pilosa* (Fée) R.C.Moran, which differs by fewer pinnae (1–4 vs 5–7 pairs) and pilose blade surfaces (vs glabrous to sparsely pilose).

*Tectaria pilosa* **(Fée) R.C. Moran**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP; alt. 226 m; 10 Mar. 2010; A. Stival-Santos et al. 1972 col.; FURB 47077. • ibid; alt. 317 m; 10 Mar. 2010; T.J. Cadorin et al. 1458 col.; FURB 47099, HUCS 43651.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

Thelypteridaceae Pic. Serm.

*Amauropelta raddii* **(Rosenst). Salino & T.E.Almeida**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, Lagoa do Peri, Cachoeira Pequena; alt. 250 m; 17 Apr. 1980; A. Bresolin and M.L. Souza 1421 col.; FLOR 0021527.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Endemic to Brazil.

**Identification.** Rhizomes short-creeping to erect, covered with lanceolate, light-brown scales; leaves monomorphic; petioles stramineous, sparsely covered with rhizome-like scales, pubescent; blade 1-pinnate-pinnatifid, elliptic, subabruptly reduced at the base, with 3–4 pairs of smaller pinnae, which are usually auriculiform; pinnae sessile, lanceolate, apices acute; sori round; and indusia orbicular to reniform, glabrous. The most similar species in the park is *Christella hispidula* (Decne.) Holttum, which differs by proximal pinnae not reduced or only slightly reduced (vs strongly reduced), and the pinnae apices acuminate (vs acute).

*Christella hispidula* **(Decne.) Holttum**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP, trilha do Saquinho; alt. 21 m; 11 Mar. 2016; A.A. Carmes et al. 48 col.; FLOR 0062830.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Pantropical.

*Macrothelypteris torresiana* **(Gaudich.) Ching**

**Material examined.** BRAZIL • Santa Catarina, Florianópolis, PMLP, trilha do Saquinho; alt. 22; 11 Mar. 2016; A.A. Carmes et al. 47 col.; FLOR 0062867.

**Habitat.** Dense Ombrophilous Forest.

**Habit.** Terrestrial.

**Distribution pattern.** Pantropical.

*Meniscium serratum* **Cav.**

**Material examined.** BRAZIL • Santa Catarina, Ilha Sta. Catarina, prope Lagoa Peri; 9 Jan. 1960; A. Sehnem 7609 col.; NY 1016579, US 259188.

**Habitat.** Not reported in the specimen label.

**Habit.** Terrestrial.

**Distribution pattern.** Neotropical.

## Unconfirmed species

Anemiaceae

***Anemia warmingii* Prantl.**: A. Sehnem s.n. col. (PACA 76193).

Dennstaedtiaceae

***Dennstaedtia dissecta* T.Moore**: A. Sehnem 9456 col. (PACA 77715).

Pteridaceae

***Adiantopsis radiata* (L.) Fée**: A. Sehnem 9455 col. (PACA 76744)

***Doryopteris concolor* (Langsd. & Fisch.) Kuhn**: Sehnem 9451 col. (PACA 77755).

***Pteris angustata* (Fée) C.V. Morton**: A. Sehnem s.n. col. (PACA 71652).

Selaginellaceae

***Selaginella muscosa* Spring.**: A. Sehnem s.n. col. (PACA 77325).

## Discussion

In Brazil, the Atlantic Forest is well-known as the richest biome in number of ferns and lycophyte species (Prado et al. 2015), likely due to its huge diversity of habitats along the latitudinal and altitudinal variation. The LPMP has a total area of ca 1,430 ha covered with vegetation and presented 81 ferns and one lycophyte confirmed species, with an average of 0.06 species/ha. This value is comparatively lower than those recorded in other areas with similar vegetation in southern Brazil: 0.07 epiphytic fern species/ha in Reserva Volta Velha, Santa Catarina (Labiak and Prado 1998), 3.43 species/ha in Reserva Biológica Estadual Mata Paludosa, Rio Grande do Sul (Gonzatti 2018), and 25.38 species/ha in Ilha do Mel, Paraná (Salino et al. 2005). It is noteworthy that the LPMP is mostly covered with secondary forests in different successional stages, that may be a possible explanation to the fewer species occurring in the park. For instance, anthropogenic action is commonly observed around and inside the park, such as the illegal harvesting of palm hearts (*Euterpe edulis* Mart.; Arecaceae) and occasional fires.

Among the species recorded in the park, *Adiantum pentadactylon*, *Asplenium bradei*, and *Campyloneurum atlanticum* have the narrower areas of distribution, being endemic to the Atlantic Forest from southeastern and southern Brazil. *Asplenium bradei* has been recorded in the states of Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, and Rio Grande do Sul (Flora do Brasil 2020), and is here recorded for the first time in the state of Santa Catarina. Although widely distributed in the Atlantic Forest, *Campyloneurum decurrens* has only a few records from Santa Catarina. This species was observed only in the most preserved areas, as well as indicated in other studies (Tryon and Tryon 1982; Nonato and Windisch 2004; Moran and Labiak 2017).

The mosaic of phytophysiognomies inside the LPMP (*restinga*, and lowland, submontane and montane DOF) facilitates the occurrence of species that are adapted to different soil characteristics and luminosity. The majority of the studied species were collected in DOF, notably in submontane areas. Similarly, other studies have verified higher species richness in submontane forests compared to lowland forests (Nervo et al. 2016; Andrade et al. 2017). This is because the submontane environment is suitable for more diverse microhabitats as a result of topographical variation and soils with different conditions of humidity and fertility (Aiba et al. 2004; Moran 2008). The low species diversity observed in *restingas* was expected, since these regions comprise in general a few species that are adapted to the poor sandy soils saturated by aluminum (Nóbrega et al. 2011). *Pleopeltis lepidopteris* and *Telmatoblechnum serrulatum* were abundant in *restingas* from the LPMP. The last species occurred preferably in areas with periodic flooding, as observed in other works (Santos et al. 2004; Magnago et al. 2010; Gonzatti et al. 2014).

Most species in the park were found exclusively in areas where the vegetation is more preserved (i.e., primary or secondary forests with late successional stage), for instance *Asplenium mucronatum*, *A. oligophyllum*, *A. pteropus*, *Elaphoglossum glaziovii*, *Microgramma percussa*, *M. tecta*, *Pecluma chnoophora*, and *Tectaria pilosa* (Gasper and Salino 2015; Della and Falkenberg 2019). On the other hand, the presence of degraded areas around and inside the park favored the growth of exotic and invasive species, such as *Macrothelypteris torresiana*, which are usually found in ruderal environments (Gasper et al. 2012). The incidence of invasive species is a threat to natural ecosystems, because they can compete for resources with native species, leading to a decrease of abundance and richness of the last ones (Olden and Poff 2003; Sax and Gaines 2008; Winter et al. 2009; Vilà et al. 2011). The effects of exotic invasive species can also impact the society, as they compromise ecosystem services (Binimellis et al. 2007; Villà et al. 2015; Dechoum and Arellano 2016).

In conclusion, the diversity of species and life forms observed in this study highlights the environmental heterogeneity and importance of the LPMP for the shelter of native biota. However, human activities widely endanger the regional flora and fauna. In this sense, this work is expected to contribute to effective conservation actions in the area. To achieve this aim, studies on other plant groups are also highly needed.

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## Authors' Contributions

AAC collected the data, identified the specimens and wrote the text; MSD and DFL wrote the text; ALG and FBM reviewed the specimens and wrote the text; PF prepared the figures and wrote the text.

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